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Investigating Atoms and the Periodic Table

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Stage 1 – Desired Results

Established Goals

8.5 (A) describe the structure of atoms, including the masses, electrical charges, and locations, of protons and neutrons in the nucleus and electrons in the electron cloud;

8.5 (B) identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity;

8.5 C interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements

6.6(A) compare metals, nonmetals, and metalloids using physical properties such as luster conductivity, or malleability

Transfer

Students will independently use their learning to…

- Analyze patterns in order to infer and make predictions
- Recognize how to use resources and tools to solve a problem or locate an answer
- Construct a concise and intriguing explanation for a phenomena

Meaning

Understandings

- The atomic structure of an element determines the properties of the element and determines how the element interacts with other elements.
- The periodic table has recurring patterns that are seen in the properties of elements
- Scientists identify patterns in order to make sense of otherwise chaotic information

Essential Questions

- How can we use patterns and properties to make sense of what we cannot see?
- Why do we seek structure out of chaos?
- How small can we go? What is the value in deconstructing the makeup of our world?

Acquisition

Knowledge

Students will know…

- All matter is made up of atoms
- There are 3 subatomic particles that make up an atom: proton, neutron, and electron
- Subatomic particles can be distinguished based on mass, charge, and location within the atom
- Protons and electrons make up the charge of an atom
- Protons and neutrons make up the mass of an atom
- Protons determine an element's identity
- Valence electrons determine how reactive an element will be
- Valence electrons are located on the outermost energy level
- Elements in the same group on the Periodic Table have the same number of valence

Skills

Students will be able to…

- Identify and calculate the number of protons, neutrons, and electrons given an element square
- Draw a Bohr model of the atom
- Identify an element as metal, nonmetal, or metalloid based on its location on the periodic table
- Predict physical and chemical properties of an element based on its location on the periodic table

	electrons and will therefore react the same • Elements in the same period on the Periodic Table have the same number of electron shells • Metals, nonmetals, and metalloids have distinguishing physical properties such as luster, malleability, etc… • The periodic table is organized by increasing atomic number	

Stage 2 – Evidence

CODE (M or T)	**Evaluative Criteria** (for rubric)	
T , M	Rubric	Performance Task(s) *Students will demonstrate meaning-making and transfer by…* **Textbook Page** Students will be creating an engaging "textbook" page that both illustrates and explains atoms, the periodic table, and why people should care about the periodic table. Students will work in groups of no more than 3 to create an engaging "textbook" page on poster paper. Students will begin the performance assessment by engaging in a constructive analysis of how a textbook describes elements and the periodic table versus how author Theodore Gray describes the different elements found on the periodic table in his book The Elements: A Visual Exploration of Every Known Atom in the Universe. This will inform the student's decision on a template for their page and also encourage them to consider how to portray information to others. Students will then present their product through a gallery walk.
A	Menu	**Atoms Color Board Assignment** Students will have the opportunity to select from a menu the assignments they wish to complete in order to demonstrate their understanding of the content. The menu is a suite of performance tasks based on the 8 multiple intelligences. Students will select one performance task from the reading section, one from the Thinking section, and another from the vocabulary section. --- Other Evidence (e.g., formative) • DUGI's (Did U Get It?) Exit Tickets • Quick Write Prompts

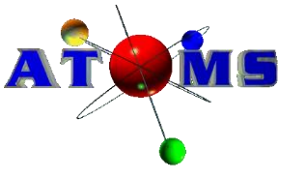
Stage 3 – Learning Plan

CODE (A, M, T)	Pre-Assessment
	Students will complete the What Do I Know About Atoms and Periodic Table mini-quiz. This consists of a list of statements that the students have to decide individually if they agree or disagree with on their own. Then they will discuss with their group. I will call on students to share any thoughts on the statements and upcoming unit. Students will return to these statements at the end of the unit. • WDIKA Atoms and Periodic Table

	Learning Activities	Progress Monitoring
A	Lesson 1: New American Lecture on Parts of an Atom • Students will watch/listen to the video "Powers of 10, then they will write down and discuss observations about 3 different atom models. Students will then listen to an interactive lecture on the atom and its subatomic particles	Student's responses to questions asked during the lecture.
T, A	Lesson 2: Positive ID Mystery! • Students will be tasked to solve a mystery: Some poor people died from an accidental ingestion of elements! The students will be tasked with figuring out which element each person ingested. They will be presented with the "bodies" of the people that have a major clue on them (plus signs which represent protons). This lesson will reiterate that protons identify elements and that atomic number on the periodic table is the number of protons. • Positive ID • Positive ID men	Quick write prompt: Why is the proton the most important subatomic particle in the atom
T, A	Lesson 3: Petri Dish Atoms (2 days) • Students will observe models of atoms (different types of beans in a petri dish) and identify their numbers of protons, neutrons, and electrons. Students will use data collected from previous lesson and identify the atomic number, mass number, and element name. They will use their data to begin drawing Bohr models of atoms themselves • Petri Dish Atoms Data Collection • Petri Dish Atoms Practice	Petri Dish conclusion questions and Bohr model drawings will be checked for accuracy
T, A	Lesson 4: Counting and Atom Building • Students will learn to use the periodic table to identify numbers of protons, neutrons, electrons. Now they can build atoms and identify valence electrons. • Counting Notes and Practice	DUGI/Exit ticket (3-5 STAAR like questions)
A	Lesson 5: Magnetic Atoms • Students will use magnetic atom boards to create atom models and compare/contrast them • Worksheet	Quick write prompt: Explain how you find the numbers of protons, electrons and neutrons using a periodic table.
A	Lesson 6: Atoms Model Day Scavenger Hunt • There will be various atom models scattered throughout the room, students are given clues and must identify the atom model correctly • Scavenger Hunt • DUGI	DUGI/Exit ticket (3-5 STAAR like questions)
A	Lesson 7: Color Board Performance Task (2-3 days) • Assignment will be explained and students will choose which 3 assignments from each category (Reading, Thinking, Vocabulary) they wish to complete. They will gather the materials they will	Check in with students on their progress and understanding. Students will submit their 3 assignments which will be

	need and begin working. They will have 2-3 whole class period work days. • Atoms Color Board Materials	checked for accuracy and completion.
T, A	Lesson 8: Concept Attainment (*The Strategic Teacher*) • Students will be provided with yes and no examples of atoms that belong to the same group and then atoms that belong to the same period. They will identify what all the yes examples have in common and the critical attributes they have.	Exit Ticket: Students will be presented with various atoms and determine which atoms go in the same group and which go in the same period
T, M, A	Lesson 9: Periods and Groups on the Periodic Table Notes (2 days) • Students will draw in electron configurations for the first 20 elements on the periodic table. This periodic table will serve as notes in their interactive notebook. This will reiterate what we learned previously about groups and periods but now they will see the pattern on a full size periodic table. Students will identify patterns of VE from their drawings. Students will take notes on group names, group number, number of valence electrons per group, and level of reactivity. They will color code their notes.	Quick write prompt: Identify a group on the PT and explain how each element fits in to the group
T, M, A	Lesson 10: Reactivity Lab • Students will complete a reactivity lab in which they test 6 elements in water, hydrochloric acid and copper chloride. They are looking for examples of reactivity • Reactivity Lab	Lab conclusion questions
T, A	Lesson 11: Metaphorical Expression (*The Strategic Teacher*) • Students will learn the difference between what makes a reactive atom and a nonreactive atom. I will present them with a metaphor I came up with to remember the difference. (Reactive atoms are "hangry" and nonreactive atoms are billionaires) Students will then be tasked to make up a metaphor that will help them remember the difference. They may work with a partner or alone. • Graphic Organizer • Powerpoint	Students will create a metaphor for reactive and nonreactive atoms. This will be checked for accuracy and creativity.
A	Lesson 12: Metal, Nonmetal, Metalloids Review • Students will create a mini periodic table in their interactive notebook where they shade in where you find metals, nonmetals, and metalloids on the periodic table. They will then construct a foldable in their notebook going over the 5 main physical properties. • Mini Periodic Table • Foldable Outside • Foldable Inside	DUGI/Exit ticket (3-5 STAAR like questions)

A	Lesson 13:Practice with Metals, Nonmetals, and Metalloids Sort • Students will be tasked with sorting physical properties as either that of metals, nonmetals, and metalloids • Metals, Nonmetals, Metalloid Chart	Students charts will be checked for accuracy
T, M, A	Lesson 14: Practice Using the Periodic Table • Complete independent practice utilizing the periodic table to identify location on the periodic table, relationships with other elements, and properties of elements. I will do a think-aloud, then we will do a few as a class, and then students will complete the rest independently • Independent Practice	Students will turn in their worksheet which will be checked for accuracy.
T	Lesson 15: Pattern Maker Lesson (*The Strategic Teacher*) • Students will identify the key parts of what makes a good and interesting explanation by comparing their textbook's writing style to the writing style of Theodore Gray's book The Elements: A Visual Exploration of Every Known Atom in the Universe • Pattern Maker Graphic Organizer	Think-Pair-Share discussion on what makes for a good explanation
T, M, A	Lesson 16: Performance Assessment - Workday I • Students will make a rough draft of what they want their final product to look like • Textbook Page Instructions • Rubric	Rough draft of textbook page
T, M, A	Lesson 17: Performance Assessment - Workday II • Students will create their textbook page on poster paper	Final textbook page
T, M, A	Lesson 18: Performance Assessment - Gallery Walk • At the start of class students will hang their poster up and the students will walk around, observe, and provide feedback on each other's work. Students will reflect on what they have learned in this unit and return to the What Do I Know About Atoms and Periodic Table statements they were presented with at the start of this unit. • Feedback Forms	Students will return to the What Do I Know About Atoms and Periodic Table Statements and reflect on their new level of understanding the content.
Resources and Materials **Lesson materials in this unit made in collaboration with Brandy Bagnall and Jennifer Alford at Corbett Jr High*		

What do I know about 

NOW			LATER	
Agree	**D**isagree	1. Different elements are composed of the same kind of atoms	**A**gree	**D**isagree
A	**D**	2. It is possible to determine the EXACT location of electrons at any given time	**A**	**D**
A	**D**	3. Almost all of the mass of an atom is found in the center	**A**	**D**
A	**D**	4. An atom's volume is mostly the empty space of where the electrons fly around.	**A**	**D**
A	**D**	5. All atoms are composed of only protons, neutrons, and electrons	**A**	**D**
A	**D**	6. Neutral atoms have the same number of protons and electrons	**A**	**D**
A	**D**	7. The protons determine the identity of the element	**A**	**D**

What do I know about my 

NOW			LATER	
Agree	**D**isagree	1. Most elements are considered nonmetals	**A**gree	**D**isagree
A	**D**	2. Elements in the same period (going across) have similar properties	**A**	**D**
A	**D**	3. Elements in the same group (going down) have the same number of valence electrons	**A**	**D**
A	**D**	4. Valence electrons are located on the outermost energy level	**A**	**D**
A	**D**	5. Reactivity of an element depends on its number of valence electrons	**A**	**D**
A	**D**	6. You can predict properties of an element just by knowing where an element is on the periodic table	**A**	**D**
A	**D**	7. The periodic table is organized by increasing atomic number	**A**	**D**
A	**D**	8. The element above or below oxygen is more similar than the element to the right or left of oxygen	**A**	**D**
A	**D**	9. Conductivity is a chemical property	**A**	**D**
A	**D**	10. Reactivity is a chemical property	**A**	**D**

Name: _____ Period: _____

Part 1: Textbook

Read and analyze the page from your textbook. Then consider the following questions.

1. Was it easy to read? Was it interesting?

2. Where is there room for improvement?

Part 2: The Elements: A Visual Exploration of Every Known Atom in the Universe

Question	DESCRIBE what the author does	PROVIDE specific examples
How does the author grab the reader's attention?		
How does the author use language to make their points quickly?		
How does the author use pictures to make their message more appealing?		

Name: _____ Period: _____

Part 1: Textbook

Read and analyze the page from your textbook. Then consider the following questions.

3. Was it easy to read? Was it interesting?

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How does the author grab the reader's attention?		
How does the author use language to make their points quickly?		
How does the author use pictures to make their message more appealing?		

Name: _____

Textbook Page Instructions

Background: Yesterday we looked at how a textbook describes atoms and the periodic table versus how the book "The Elements: A Visual Exploration of Every Known Atom in the Universe" describes atoms found on the periodic table. As a class we decided on the most important information to be included on our textbook page. Now it is your turn to teach others in the class what you know about atoms and the periodic table!

The Project: You will be creating an engaging "textbook" page that both illustrates and explains atoms, the periodic table, and why people should care about the periodic table. You will work with your group to create an engaging "textbook" page on poster paper. You will have 2 days to complete your textbook page. Before the end of Day 1 you must show me a rough draft of your textbook page. Day 2 will be the day you put it on the big poster paper. It must contain the list of things below. You may also refer to the rubric on the back of this paper for more specifics.

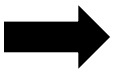
Checklist for a Complete Project:

- ☐ Explanation of how the periodic table is organized (Minimum 1 paragraph)
  - ☐ Relevant and engaging hook to your explanation
  - ☐ Concluding statement on why the periodic table matters in the real world
- ☐ Sketch of the periodic table with groups and periods labelled
- ☐ Draw Bohr models of at least 2 elements in the same group
- ☐ Draw Bohr models of at least 2 elements in the same period

I Worked Today! – I will check your work before you leave class.

Day 1	**Day 2** **Due at the end of class**
Teacher's Approval: _____ ☐ Rough Draft of textbook page that includes everything in the checklist ☐ Something I'm proud of doing today: _____ ☐ Something I need to improve on: _____	Teacher's Approval: _____ ☐ Final product was turned in and includes everything listed on the checklist ☐ Something I'm proud of doing today: _____ ☐ Something I need to improve on: _____

Presentation: You are going to hang your poster up and the class will engage in a gallery walk around the room to look at everyone's poster and provide some feedback on each other's work.

TURN OVER FOR RUBRIC! 

I can...	Novice	Proficient	Artisan
Start my explanation with a hook. _____ / 5 points	My hook is too long, not relevant, or not engaging.	I start with a hook that is short, relevant, and engaging.	My hook is very well done and relevant to our lives as middle school students.
Illustrate the periodic table. _____ / 5 points	My illustration is small or messy. My illustration is not accurate. My illustration is not labeled.	My illustration is large, neat, and legible. My illustration is accurate to the number of rows and columns. My illustration labels periods and groups.	My illustration is professional-level. My illustration is exceptionally accurate. My illustration is easy to read with a quick glance.
Illustrate atoms in the same period. _____ / 10 points	My reduced Bohr models are messy, not labeled, or hard to read.	My reduced Bohr models are clean, labeled, and easy to read.	My reduced Bohr models have perfect circles and are very easy to compare.
Illustrate atoms in the same group. _____ / 10 points	My reduced Bohr models are messy, not labeled, or hard to read.	My reduced Bohr models are clean, labeled, and easy to read.	My reduced Bohr models have perfect circles and are very easy to compare.
Explain how the periodic table is organized. _____ / 60 points	My explanation is missing vocabulary or does not use the vocabulary to explain how the periodic table is organized.	My explanation correctly uses **atomic number, period, group, energy level,** and **valence electron** to explain how the periodic table is organized.	My explanation shows I know all the vocabulary well, gets to the point quickly, and is easy for even younger students to understand.
Explain why people should care about the periodic table. _____ / 10 points	My explanation is shallow, not convincing, or missing this part.	I end my explanation by showing the reader why the periodic table matters in the real world.	My real-world connection would make Theodore Gray proud to have me as a co-author for his next book.

Team Member			
What did I do? Be detailed!			

Creator of the Poster: _____ I loved that … Next time you might consider …	Creator of the Poster: _____ I loved that … Next time you might consider …
Creator of the Poster: _____ I loved that … Next time you might consider …	Creator of the Poster: _____ I loved that … Next time you might consider …

Creator of the Poster: _____ I loved that … Next time you might consider …	Creator of the Poster: _____ I loved that … Next time you might consider …
Creator of the Poster: _____ I loved that … Next time you might consider …	Creator of the Poster: _____ I loved that … Next time you might consider …

Atoms Color Board

You must have at least two different colors!

See individual paper for more specific instructions

Reading	**GREEN-R:** Read the article "shiny diamonds may make screens stronger on smartphones" and answer the attached questions	**BLUE-R:** Read the article "If diamonds are forever, maybe they can help protect smartphones" and answer the attached questions	**PINK-R**: Analyze the given data and do a smidge of research
Thinking	**GREEN-T**: Draw a labeled model of the atom Beryllium, compare that to an atom with 9 protons, 8 electrons, and 10 neutrons	**BLUE-T:** Form a performance group. Design models or a production about atoms. Make a video or perform in front of the teacher or class.	**PINK-T** (GT): How does the small word of atoms and atomic theory interact with CERN's Large Hadron Collider in Switzerland?
Vocabulary	**GREEN-V:** Complete 3 acrostic poems: one for proton, one for neutron, and one for electron	**BLUE-V:** Complete two papers "I Am" and a "Thinking Triangle"	**PINK-V :** Create a poem, rap, song, or story about atoms. You must include every atoms vocabulary word listed.

This is a test grade

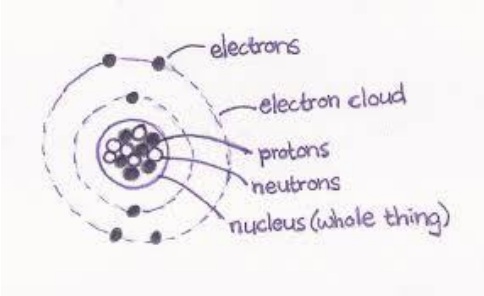
Reading worth 25 points, Thinking worth 50 points, Vocabulary worth 25 points

Name: _____ Period: _____ DUE: _____

GREEN-Vocabulary: Acrostic Poems

Using the words "PROTON" "NEUTRON" and "ELECTRON," create 3 acrostic poems. For an acrostic poem, you write a statement relating to the entire word that stars with each letter. Statements must be written with your best handwriting using correct grammar (capitalization and punctuation) and spelling. You also need to draw a related picture under each word. Your science teachers did an example for you ☺

A ll matter is made up of atoms!
T he nucleus, with protons and neutrons, contains most of the mass.
O utside the nucleus is the electron cloud, which contains electrons.
M ost of the atom is empty space.



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Name: _____ Period: _____ Due_____

BLUE-Vocabulary: I Am and Thinking Triangle

Part I: Complete the I Am using any atoms vocabulary word you choose. You are trying to get the reader to guess your vocabulary word without telling them what it is.

I am _____, _____,

_____, and _____.

I appreciate _____

but not _____.

_____, _____,

and _____ are important to me.

I think _____,

but _____.

I wonder if _____.

I care about _____,

and _____.

I can _____,

and _____.

I want _____.

The future _____

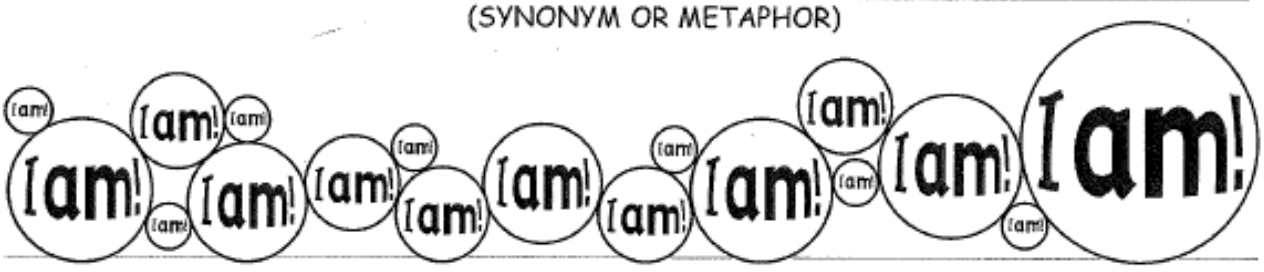
_____.

So I _____.

This is who I am! I am _____.

I am _____.

(SYNONYM OR METAPHOR)



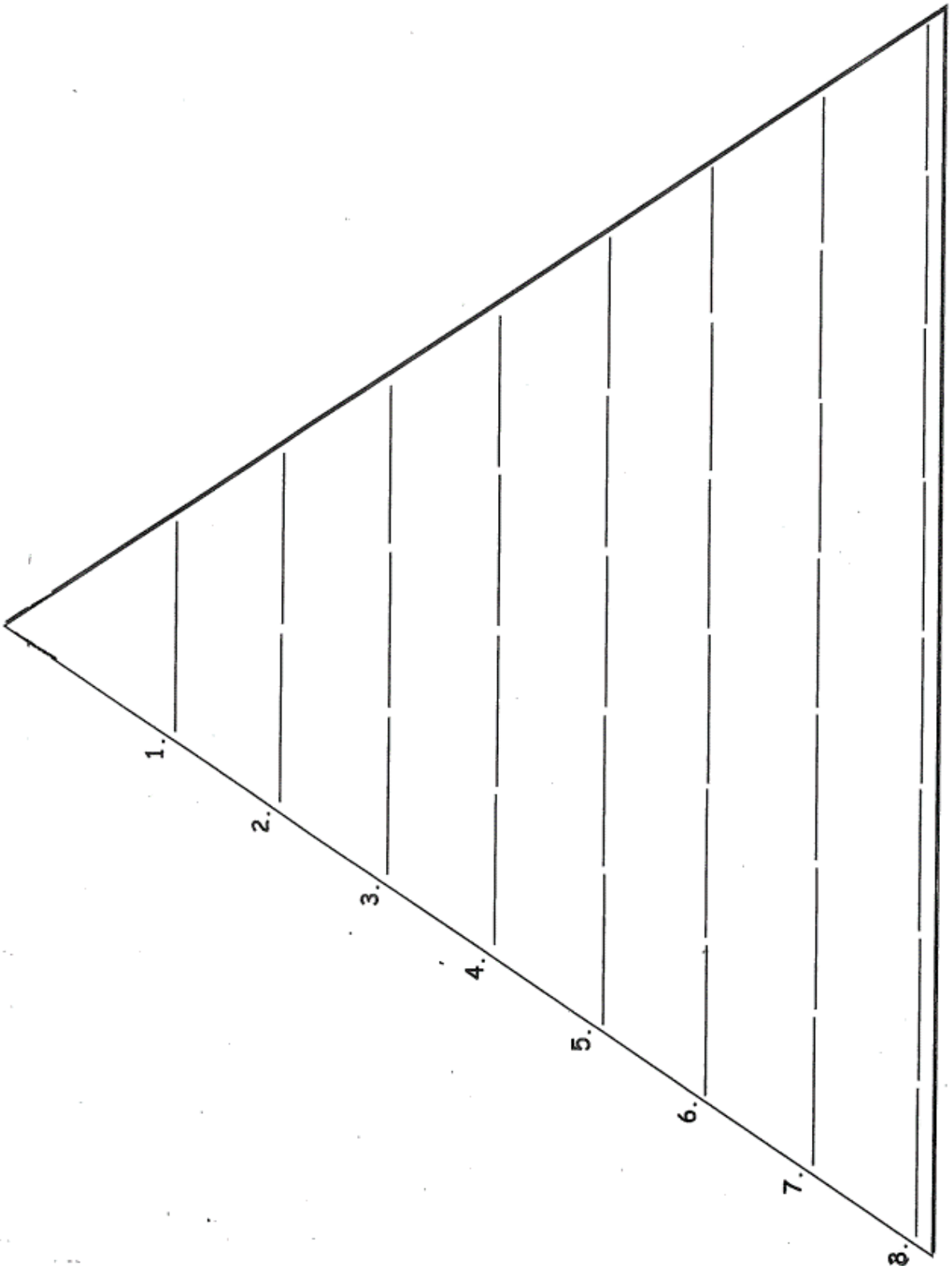
My Word: _____

Part II: Complete the Thinking Triangle.

Each line of the triangle is also how many words should be in each line; for example, on line 5 you should use 5 words.

Line 1 is the subject: atoms Lines 2, 3, and 4 may be phrases Lines 5, 6, 7, and 8 must be complete sentences

Regardless if you are using phrases or complete sentences, each line must make sense as a whole. This means you cannot just list words!



Name: _____ Period: _____ Due_____

PINK-Vocabulary: Poet, Author, Rapper

Think about all we have learned about atoms. Create a poem, story, rap or song filled with facts or memories about atoms. Regardless of your chosen piece, you must include the following: (proton, neutron, electron, nucleus, electron cloud, identity, atomic number, atomic mass, atom). All works must be original (no cutting/pasting, copying, or plagiarizing). Works may be handwritten (best handwriting!) or typed.

Important note: make sure as you are letting your words flow you also slide in some characteristics/definitions of each of the above words. You may use more paper than this, below is just starter paper.

_____

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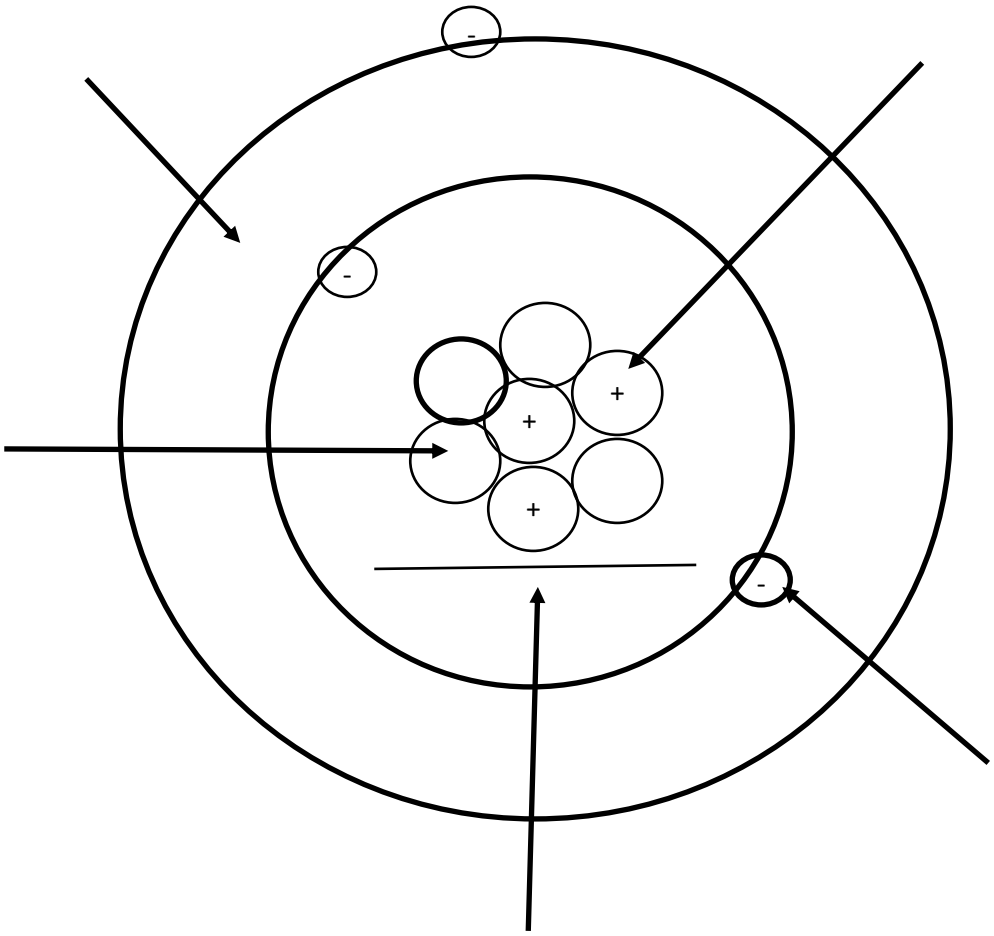
Name: _____ Period: _____ DUE: _____

GREEN-Thinking: Models – Teacher Approval Required

Part I: Interpreting a Model

Label the parts of the model below then answer the questions



1) What is the atomic number? _____

2) What is the mass of the atom? _____

3) What is the charge of the atom? _____

4) What is the identity (name) of the atom? _____

5) What part of the atom contains ALL the mass? _____

(more on back)

Part 2: Creating a Model

Your turn! Draw a model of the element Beryllium (Be); you will need a periodic table. Make sure it is neat (round circles, straight lines, etc…). Make sure the correct subatomic particles are in the correct places. **Extra credit if you design and build your own model!**

Pre-drawing questions

1) How many protons does Beryllium have? _____

2) How many electrons does Beryllium have? _____

3) How many neutrons does Beryllium have? _____

Explain how you figured that out _____

4) What subatomic particle tells us this is Beryllium? _____

Name: _____ Period: _____ Due_____

GREEN-Thinking: Comparing and Contrasting Atom Models

Compare and contrast two different atom models.

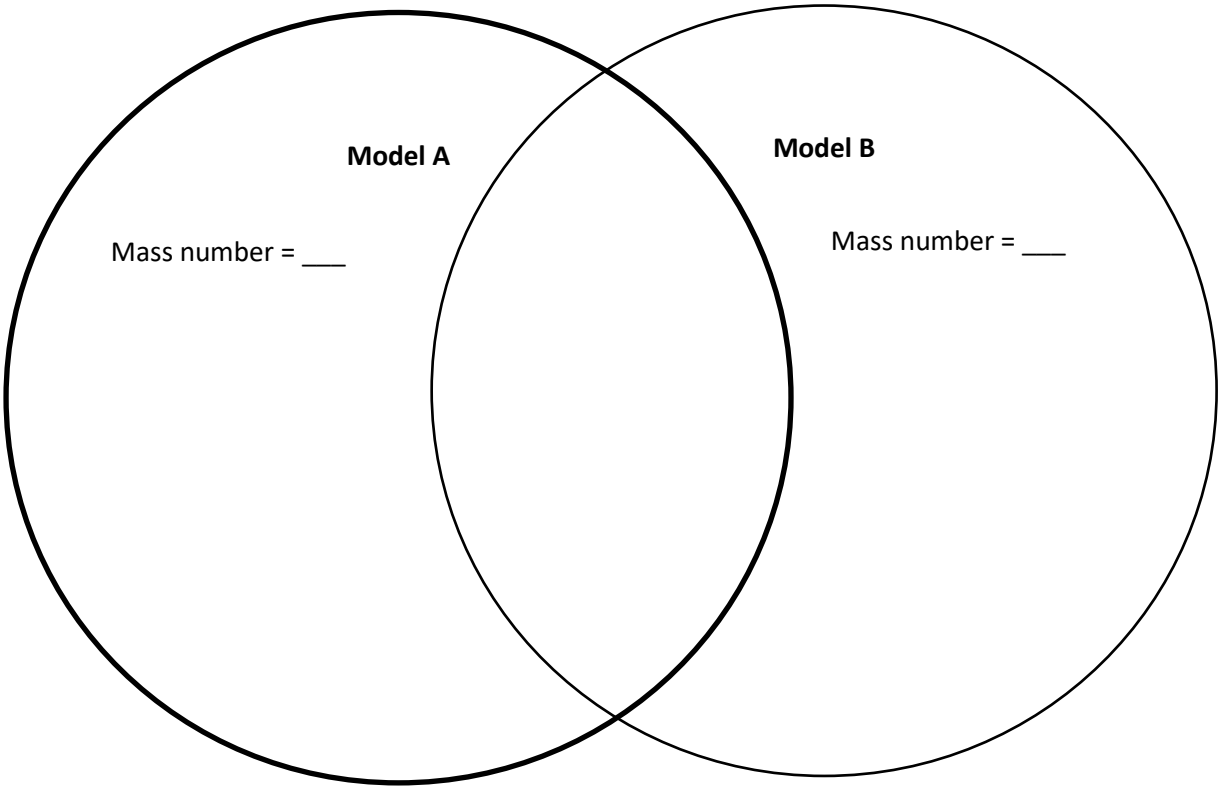
When drawing make sure make sure it is neat (round circles, straight lines, etc…) with 3 different colors and a key. Make sure the correct subatomic particles are in the correct places with the correct numbers and charges. **Extra credit if you design and build a 3rd model of your own choice (no Hydrogen or Helium)**

Model A: Draw a model of the atom Beryllium (Be)

Model B: Draw a model of an atom with 9 protons, 8 electrons and 10 neutrons

Compare and contrast Model A and Model B from the front. This means there are things that the models have that are different and some things that are the same. Fill out the Venn Diagram; remember similar items go in the common space in the middle. Make sure to use your best handwriting AND your vocabulary words (mass number, atomic number, etc).

Helpful hint: be specific (see the example below), also don't forget about identity and charge! There is 1 thing these atoms have in common (hint: look on the outside)



Finally, what would happen if subatomic particles were gained or lost? You can discuss in general terms or you may use Model A or Model B to help explain your answer.

Remember: Use your best handwriting and write in complete sentences with correct spelling and proper grammar (capitalization and punctuation).

_____

_____

_____

_____

_____

Name: _____ Period: _____ Due_____

BLUE-Thinking: Performance Group

Part I: What Am I Doing?

- Form a performance group to complete an interactive atom teaching

Part II: What Do We Have to Have?

- Explain locations and properties of subatomic particles
- What happens when particles are gained or lost
- Build or act out two different atom models (not Hydrogen and/or Helium)
- Compare and contrast atom models (similarities and differences)

Part III: Product Options (choose 1)

- Build models (human or 3D) and explain your components to the class
- Write a play and perform for the class or teacher
- Make a video and show it to the class or teacher

Group Maintenance

- Create a group name and list all members and their roles.
- Teacher approval is required for groups over 4 members, no group may exceed 6 members
- Teacher approval is required to work with students in other class periods.

Group Name: _____

Members	Role
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

We will be developing…

_____ Class Instruction

_____ Play

_____ Video

Name: _____ Period: _____ DUE: _____

PINK- Thinking: CERN's Hadron Collider and the Atom

Question: How does the small world of atoms and atomic theory interact with CERN's Large Hadron Collider?
Answer: You find it!

Part 1: Background

1) Research CERN: where are they based, what is their mission, what are their areas of study?

2) CERN Experiments: what are some past and current experiments they are working on, what was learned, where do they conduct their experiments

3) Where do you want to focus your study? You have 2 options, choose 1

Option A: What is 1 experiment you are interested in: why is it important, how is the experiment run, what have been the results, what are the missing pieces, if you were one of these scientists what other experiments would you want to completed based on the results

Option B: What are some ethical concerns of particle research, atomic theory, nuclear power/energy? Select 1 or 2 and lay it out: what are the pros, what are the cons, what do you personally think????

Part 2: Product

Now you must share this information with the world (or at least your teacher)! Design a product to showcase/highlight your findings. You can write a research paper, design a PowerPoint, make a poster, make a collage, make a model, make a video, make a diorama, use Adobe Spark, use Canva, design an infographic; it is completely up to you!

Name: _____ Period: _____ DUE: _____

GREEN- Reading: Shiny Diamonds May Make Screens Stronger on Smartphones

Before Reading: What do you think when you hear the word "diamond"? Write down all of the words that come to mind. Draw a picture of what you see when you hear this word.

During Reading: Highlight facts you already know about diamonds in blue. Highlight new or unknown information about diamonds in yellow.

After Reading: Take the quiz below

1A. Read the paragraph from the section "Some People Wonder If It Will Work."

> *Diamonds are not unbreakable, says Jim Butler. He worked in a lab for the U.S. Navy. Diamonds can crack under enough force.*

What does the author mean by saying diamonds are "not unbreakable"?

(A) Diamonds never break. (B) Diamonds can break.

(C) Diamonds are perfect. (D) Diamonds get scratched.

2A. Read the paragraph from the section "Screens Must Be Made Carefully."

> *As diamonds are made, lots of energy is created. Energy makes heat. A diamond is very good at deflecting heat. It can handle up to 2,200 degrees Fahrenheit of heat.*

Which word could replace "deflecting" in the paragraph above WITHOUT changing its meaning?

(A) blocking (B) moving (C) changing (D) losing

3A. Read the paragraph from the section "Some People Wonder If It Will Work."

> *A study came out recently. It said that 3 out of every 10 U.S. smartphone users have cracked screens. Many people keep using those screens anyway*.

What information do you get from this paragraph?

(A) how many people crack the screens on their smartphones (B) what causes smartphone screens to crack

(C) how smartphones are still able to work with cracked screens (D) what date the study was published on

4A. Which section, in the introduction, gives information about what diamonds are commonly used for? _____

5A. What is the main idea of the article?

(A) A great number of people crack their cell phone screens

(B) Diamonds may be able to help solve the problem of cracked screens

(C) Diamonds are very strong, but they still can crack

(D) It requires a tremendous amount of heat to make a diamond

Name: _____ Period: _____ DUE: _____

BLUE – Reading: Diamonds are Forever, Maybe They Can Help Protect Smartphones

Before Reading: What do you think when you hear the word "diamond"? Write down all of the words that come to mind. Draw a picture of what you see when you hear this word.

During Reading: Highlight facts you already know about diamonds in blue. Highlight new or unknown information about diamonds in yellow.

After Reading: Take the quiz below

1B. Read the selection from the section "Tricky Problem Must Be Solved."

> *The glass and its diamond coating will have different reactions, even at those temperatures. Temperatures always change, he says. As temperatures change, this causes pressure between the glass and the diamond film above it*.

Which of the following sentences uses "film" in the SAME way as the selection above?
(A) The college professor showed a historical film about World War II.
(B) The photographer could not wait to develop the roll of film she had shot.
(C) The student had to film a short video for his final project.
(D) After a very cold night, there was a thin film of frost on the grass.

2B. Read the sentence from the section "Gems Can Be Made In A Lab."

> *The company says it will be less likely to scratch or shatter*.

Which phrase from the article helps you understand what happens when smartphones "shatter"?
(A) difficult to scratch (B) spider web-like cracks (C) change in temperature (D) doesn't do well in heat

3B. Overall, the article is organized around:
(A) an idea and a process (B) a company and a problem
(C) a person and a product (D) a gemstone and a location

4B. Which number in the section "Gems Can Be Made In A Lab" uses problem and solution in its structure? _____

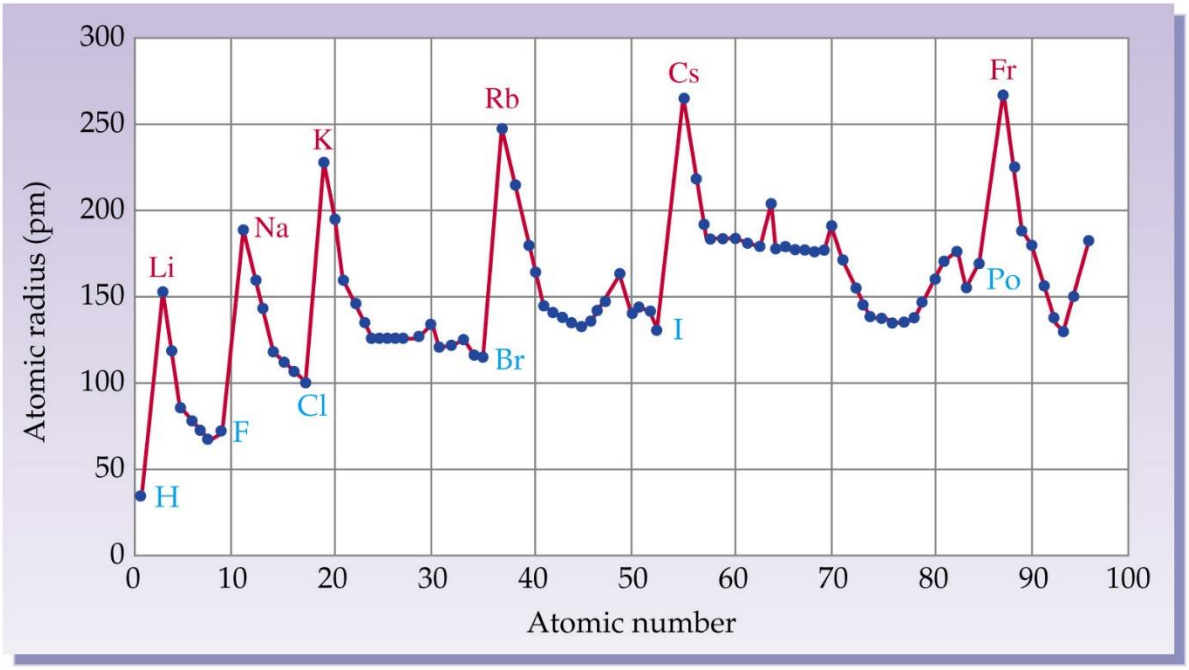
5B. What is the main idea of the article?
(A) A great number of people crack their cell phone screens
(B) Diamonds may be able to help solve the problem of cracked screens
(C) Diamonds are very strong, but they still can crack
(D) It requires a tremendous amount of heat to make a diam

Name: _____ Period: _____

PINK-Reading – Data Analysis

Look at the graph below. Make sure you read the title, x-axis label, and y-axis label. Interpret the graph and answer the questions below. You may have to look up the following words to analyze correctly: atomic radius, atomic number, metals, metalloids and you probably want to have a periodic table handy to find out where the elements are…

Atomic Radius versus Atomic Number for Metal and Nonmetal Elements



Questions (when necessary, use your best handwriting and write in complete sentences with correct spelling and proper grammar (capitalization and punctuation).

1) Describe the relationship between atomic radius and atomic number.

_____

_____

_____

2) Generally, what happens as you move down (not across) the periodic table for the elements shown?

A) Atomic radius increases B) Atomic radius decreases C) There is no relationship

3) Generally, what happens as you move across the periodic table for the elements shown?

A) Atomic radius increases B) Atomic radius decreases C) There is no relationship

4) Find the element Cesium (Cs) on the graph. What is its approximate atomic number and atomic radius?

A) 55 and 275 B) 55 and 225 C) 52 and 145 D) There is not enough information to answer

5) On the back of this paper, draw a representation of a periodic table. Draw in arrows to show the pattern of atomic radii. Explain why this pattern exists.